

The Cornell Medical Index, a health questionnaire, has possibilities as an epidemiologic tool. The author discusses the uses of the index, as well as its limitations, and suggests modifications to enhance its usefulness.

THE CORNELL MEDICAL INDEX AS AN EPIDEMIOLOGICAL TOOL

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THE purpose of this paper is to review the value of the Cornell Medical Index¹ (CMI) in epidemiological studies. The CMI is a well-known health questionnaire which was originally developed in the United States as an aid to the clinician. A number of studies in the United States and Britain have demonstrated its value for this purpose, both as an aid to diagnosis²⁻⁵ and as a screening procedure.⁶⁻⁹

The CMI comprises 195 simply worded questions which are answered "yes" or "no." Each "yes" response indicates that the subject claims the current or, in some instances, previous presence of a stated symptom or disorder. Most of the questions relate to symptoms, and a few to specific illnesses, habits which may be associated with ill-health, and the presence of illness in other family members. The questionnaire includes 51 questions dealing with mood and feeling patterns. The detailed structure is: section A, eyes and ears (9 questions); B, respiratory system (18); C, cardiovascular system (13); D, digestive tract (23); E, musculoskeletal system (8); F, skin (7); G, nervous system (18); H, genitourinary system (11); I, fatigability (7); J, frequency of illness (9); K, miscellaneous diseases (15); L, habits (6); M, inadequacy (12); N, depression

(6); O, anxiety (9); P, sensitivity (6); Q, anger (9); and R, tension (9). Different forms of the CMI are used for men and women, identical except for six questions in the genitourinary section. The questionnaire can be self-administered. It is usually completed in 10-30 minutes.

In clinical use, the responses are supplemented by a detailed story of the patient's complaints and an oral elucidation of the positive responses. There is close correspondence between responses to the questionnaire, and data given to physicians on oral interview.²

The attractiveness of the CMI for use in epidemiological studies lies not only in its ease of administration (both because it is a paper-and-pencil test and because of the nonthreatening nature of its contents⁸), but also in its subsidiary value in the clinical care of the respondent.

Validity as an Indicator of Health

A number of studies have demonstrated the validity of the CMI as an indicator of health status, using different methods of handling the responses and various dimensions of health. It has been shown that by a clinical appraisal of the responses, that is, by a review of the number and distribution

and, in particular, the identity of the questions answered positively, physicians can identify almost all (94 per cent) of the diagnostic categories in which disease was found on hospital investigation, and can often infer (in 87 per cent of these areas) what specific medical conditions are present.³ This method is also of high validity as an indicator of the presence and severity of emotional disturbance.⁴ Unfortunately, in the words of the authors of the CMI, "No rules can be given . . . on the method of interpreting the patient's complaints in the Cornell Medical Index. Diagnostic interpretations of medical data must be based upon the physician's own training, knowledge, experiences, and insight."³

This suggests a need for special precautions to minimize judgmental bias, such as those used in the Midtown Manhattan Study where mental health ratings were based upon two independent appraisals of the interview data.¹⁰ However, such a method, useful though it may be in a single study, is clearly not sufficiently objective for more widespread epidemiological use, if comparable data are to be assured. For epidemiological purposes, less subjective methods of appraising CMI data are to be preferred. A number of such methods have been used in relation both to specific diseases, and to general emotional health and other less specific health dimensions.

Specific Diseases

Objectively interpreted, the CMI appears to be of very limited value as an indicator of the presence of specific diseases. Two possible methods of interpretation require consideration. First, the CMI includes a number of questions which refer to named disorders, such as "Do you suffer from asthma?" and "Has a doctor ever said you had stomach ulcers?" Detailed studies of inter-

view-based morbidity surveys have shown that while the responses to such questions concerning some diseases may correspond fairly well with diagnoses reported by the respondents' own physicians, they are likely to bear little similarity to the findings of thorough clinical examinations; moreover, this dissimilarity may vary considerably among different population subgroups.¹¹⁻¹⁵

In the words of one study, "The magnitude of the differences is in large measure a reflection of the state of medical diagnosis and patient-physician communication in routine general medical care. . . . The variation of this magnitude from one area to another, and even within areas, can be assumed to be extensive."¹⁶ This consideration apart, the CMI, which was not designed as an independent index of the presence of specific diseases, is clearly inferior (in its lack, for example, of direct and indirect recall questions) to questionnaires designed for this purpose.

An alternative possibility is to infer the presence of specific disorders from the occurrence of specific constellations of responses, using the principle incorporated by Nash into his "logoscope," a slide-rule-like instrument which shows which diseases are consistent with the patient's pattern of signs and symptoms.^{17,18} Such a method, based upon interview data alone, has been successfully used by Cobb and his associates in devising an "Index of Rheumatoid Arthritis" (comprising three questions) which was found to be of high validity when compared with diagnoses based upon examination findings.^{19,20}

A trial of this method of interpretation has been carried out in which an electronic data-processing machine, having "studied" the CMI responses and diagnoses of 5,929 consecutive New York Hospital outpatients and empirically determined the responses characteristic of various diagnoses, was then fed the CMI data of a further 2,745

patients and required to identify their diseases.²¹ The machine made correct diagnoses in no fewer than 45 per cent of the male cases with the 60 most common diseases. However, this proportion varied considerably for different disorders. Although there were six diseases of which at least 70 per cent of the cases were correctly diagnosed, the success rate was under 50 per cent for 25 of the 60 diseases, and under 20 per cent for 14.

While these results offer hope for the further development of such a technic they suggest that the CMI—which was not designed for this particular use—does not supply adequate data for the purpose, except possibly in respect to a few diseases. It would appear that the CMI, in its present form, is not of great value as a tool in studying the occurrence of specific diseases in populations.

Emotional Health

A number of scores based upon the CMI have been used as indicators of the presence and degree of emotional ill-health. These scores are, for the most part, crude tallies of the number of positive responses to the questionnaire as a whole or to selected parts of it. (Other scores, based upon the number of questions not answered, those answered both "yes" and "no," and those to which the respondent added comments, have been proposed,⁴ but have been found less satisfactory.^{8,22}) In tallies of this kind, equal weight is given to the various questions included—a procedure which is not necessarily justified. However, the design of other and possibly superior scaling methods would require more detailed studies of the responses to various CMI questions and their interrelationships than have been published.

The total number of positive responses to the CMI has been empirically

shown to be a useful indicator of emotional health. The greater the degree of emotional disturbance in a group, the higher this "total score" tends to be.^{4,8,9,23} Typical findings are presented in Table 1 in which a "cutting point" of 30 positive responses is used. As these findings indicate, the specificity of a total CMI score of this magnitude, as an index of emotional disturbance, is fairly high, ranging from 74 per cent to 100 per cent in various studies (88-100 per cent when estimated on the basis of the findings among ostensibly healthy men, and 74-88 per cent on those among patients with no apparent psychiatric disorder). The actual specificity is probably higher than the lowest of these estimates, as these so-called "normal" groups may include a proportion of emotionally disturbed persons. The sensitivity of such a CMI score is lower, estimates ranging from 40 per cent to 79 per cent, depending upon the degree of emotional disturbance. This relatively low sensitivity is not surprising, as some emotionally disturbed persons give only a few, although possibly clinically significant, positive responses.⁴ One report states that it is a frequent experience for psychiatric patients "who will admit to a plethora of complaints in a personal interview . . . to deny all on the CMI."²²

Corresponding findings for a critical scoring level of 50 yield higher estimates of specificity (91-100 per cent), but lower estimates of sensitivity (36-62 per cent).^{4,8,23,24} Conversely, when the cutting point is reduced to 20, the specificity drops to 58-96 per cent, but the sensitivity increases to 62-90 per cent.^{4,8,23-25} A critical scoring level of 30 appears to give the best over-all discrimination.^{8,26} Similar findings for women (cutting point 30) yield specificity estimates of 70-96 per cent and sensitivity estimates of 57-86 per cent.^{4,24-26}

Other studies support the value of

Table 1—CMI scores of various groups of men: percentage with total scores of 30 or over

Group	Percentage
A. Ostensibly Healthy Persons	
Job applicants, cigarette factory, New York (205) ²⁴	0
New employees, New York Hospital (152) ⁴	3
University entrants, Jerusalem (559) ²⁵	5
Ostensibly healthy men, New York City (282) ⁴	10
Army inductees, New York City (2,176) ²³	12
B. Patients (Nonpsychiatric)	
Patients not diagnosed as neurotic, London general practice (67) ²⁶	12
Medical and surgical outpatients not diagnosed as emotionally disturbed, New York (1924) ⁴	20*
Veterans admitted to general hospital with no record of psychological disturbance or psychosomatic illness, Rhode Island (43) ⁸	26
C. Emotionally Disturbed Patients	
Veterans admitted to general hospital with notation of nervousness or tension, or diagnosis of a psychosomatic illness, Rhode Island (38) ⁸	40
Veterans admitted to medical or surgical services with previous diagnosis of psychiatric illness, Rhode Island (25) ⁸	48
Medical and surgical outpatients with diagnosis of emotional disturbance, New York (183) ⁴	52
Men rejected from army service on psychiatric grounds alone, New York City (211) ²³	59
Patients with neurosis, London general practice (19) ²⁶	68*
Psychiatric outpatients, Nebraska (45) ²²	69
Veterans admitted to psychiatric service, Rhode Island (34) ⁸	76
Veterans treated in neuropsychiatric outpatient section, Brooklyn (371) ⁴	76
Psychiatric hospital outpatients, London (28) ²⁷	79

Note: The percentages are based upon the denominator figures shown in parentheses.

* Derived figure.

the total score as an indicator of emotional health status. A recent study of adults in a London general practice demonstrated a high correlation between high scores and the presence of a clinical record of psychological disorder. It was concluded that "while a few apparently nonneurotic individuals may score above 16, none score above 30 . . . a few neurotic patients, however, score below 16."²⁸ A relationship was found, also, with poor marital adjustment, especially in women.²⁹

A New York study of army inductees indicated that scores of 50 or over were predictive of inadequacies in the first four months of training, in terms of days AWOL, convictions by courts-martial, and discharges from military service.²³ In an Oregon study, the total score was found to be highly correlated with scores in the Taylor Manifest Anxiety Scale, and significantly correlated with scores on the Saslow Psychosomatic Inventory. This applied both to medical and to psychiatric patients.³⁰

It is noteworthy that, as the findings in Table 1 indicate, high total scores appear to depend more upon the presence of emotional disturbance than on the presence of disorders not associated with emotional disturbance. This specific significance of the total score has received support from a comparison of a small group of veterans suffering from chronic illnesses with a group of veterans without chronic illnesses, matched for their degree of psychiatric disorder and for age; no significant difference was found between the total scores of the two groups.⁸

Further, a study of Indian women and adolescent girls in South Africa revealed a significant correlation between the total score and the responses to four selected CMI questions relating explicitly to worry and nervousness.³¹ Such findings do not, of course, vitiate the probability that the presence of other disorders may have an etiological

role in the production of emotional disturbance.

An early report stated that the total score was a better discriminator between "normal" and "neurotic" groups than various other tallies derived from the CMI.⁴ Other scores have, however, been used. One such is the M-R score; that is, the number of positive responses to the 51 questions in those sections of the CMI which deal with mood and feeling patterns. This score tends, like the total score, to be higher in non-psychiatric patients than in ostensibly healthy persons, and considerably higher in psychiatric patients.⁹ A critical scoring level of ten or above has been found to yield the minimum amount of misclassification of normal persons and psychiatric patients of both sexes,^{9,26} although a lower cutting point is more sensitive as an index of milder degrees of emotional disturbance.⁸ Other sectional scores (those for sections A-L and sections I-J), which are also related to the degree of emotional disorder, appear to offer no advantages over the total score and M-R score.⁸

The authors of the CMI stated that "if 'yesses' are scattered throughout the four pages of the CMI the medical problem is likely to be diffuse, often including an emotional disturbance."³ A measure of scatter has been used by Lawton who counted the number of sections A-L which had two or more "yes" responses.⁸ This "areas score" has the drawback that it gives equal weight to two positive answers in any section, although the number of questions in the several sections varies from 6 to 23. It discriminated well, however, between groups of veterans with different degrees of emotional illness.⁸ Similar scores have been used in other studies.^{22,32}

Thus the CMI yields scores (in particular, the total score, the M-R score, and the "areas score") which appear to be useful indicators of emotional dis-

order. It indicates the degree of general emotional disability, rather than the presence of specific psychiatric disorders (although it has been suggested that it is a better discriminator of neuroses than of psychoses³³ or personality disorders).²⁸ "The CMI is an uncommonly good discriminator, as paper-and-pencil tests go."⁹ Of particular significance is the fact that this has been the common finding of a number of separate investigators, despite the lack of unison on definitions or criteria of mental health and illness, and the unreliability of psychiatric diagnosis which beset studies in psychiatric epidemiology.³⁴

Somatic Health

As a corollary to the above findings, the CMI appears to be of little value as an indicator of the degree of general somatic, as opposed to general emotional, health. The total score is of little use for this purpose; very little difference was found between the total scores of army inductees and those of men rejected from military service on physical grounds alone.²³ The score for sections A-L (i.e., excluding the questions dealing with mood and feeling patterns) appears to be of no greater value. Psychiatric patients tend to have higher A-L scores than ostensibly healthy persons⁹; further, a study of hospital patients with pulmonary diseases revealed a positive relationship between their A-L scores and their scores on the hypochondriasis scale of the Minnesota Multiphasic Personality Inventory.³³ Similarly, an Oregon study revealed positive correlations between the scores for sections A-K, and scores in the Taylor Manifest Anxiety Scale and the Saslow Psychosomatic Inventory among both medical and psychiatric patients.³⁰

In a recent English study, those questions in sections A-L which were thought likely to represent functional disturbances (60 questions for men, and

64 for women of the total 144 questions) were considered separately. There was a clear positive relationship between the M-R score (mood and feeling patterns) and the score for these "functional somatic" questions; among men, moreover, those with high M-R scores and high "functional somatic" scores also tended to have high scores for the remaining "nonfunctional" questions in sections A-L.²⁹ The CMI thus does not appear to provide a useful specific indication of the degree of somatic health.

General Health

The total CMI score has been found to bear a relationship to various non-specific measures of health or correlates of health. New York army inductees with scores of 50 or over had more sick calls in the first four months of their military training and spent more days in hospital than those with lower scores.²³ Among workers in a New York factory, there was a positive correlation between the total score and the number of absences from work.²⁴ Among residents of a New York home for the aged, the total score bore a significant relationship with ratings, based upon careful medical evaluation, of over-all functional capacity.³⁵

Such findings suggest that the total CMI score may be a valid indicator of general over-all health status. It is not unlikely that this is largely a reflection of its association with the emotional component of health. Without clearer definitions and criteria of general global health than are presently available, the validity of the CMI in this respect is difficult to test. However, preliminary findings of a current study in Jerusalem indicate a high correlation between the CMI scores of a population sample and appraisals of general health made by physicians.

It is of interest to speculate on why this particular instrument appears to

hold promise in this respect when, as has been stated, "At present, the bulk of the research evidence can be interpreted as indicating that a clinical assessment of general health and the responses to survey questions about health are two only slightly correlated phenomena."¹⁴ The reason may lie in the fact that the CMI is basically a measure of the subject's own perception of his health. Individuals' self-ratings of their health have considerable implications for their health behavior, emotional state, and possibly even survival.³⁶ The validity of the CMI as a measure both of general health and of emotional health may largely be an expression of a two-way relationship between the self-perception of health and the various validation criteria used—of the influence of a person's health status on his own perception of his health, and the influence of the patient's subjective appraisal on the physician's diagnosis.

Patterns of Complaint

Apart from their use as an indicator of health status, the responses to the CMI may be taken at their face value; that is, the CMI may be used, within the limitations of the questions it contains, as a measure of the amount and type of medical complaint in a population. Such data may have both anthropological interest and significance for the planning and provision of health and medical care services.

Studies of complaint patterns may also have more immediate epidemiological relevance. A comparison of the CMI responses of university entrants in Chicago⁷ and Jerusalem,²⁵ for example, indicates that the ratio of respiratory to circulatory or digestive symptoms was considerably higher in the Chicago group. Such findings may suggest useful lines for further inquiry. Such comparisons of sectional scores may require, in view of the different number

of questions in various sections, the calculation of each respondent's mean number of positive responses per item in the sections compared.²² Symptom patterns were specifically investigated in a London study, in which, *inter alia*, patterns of association were sought between the various "functional somatic" symptoms and the responses to the CMI sections concerning depression and anger, respectively.²⁹

Use in Comparative Studies

An obvious problem besets the use of the CMI in comparative studies. As an illustration, almost all investigators have reported that women of all ages have higher, often to a considerable degree, total CMI scores than men. This has been the finding in an urban population sample in the United States,³⁷ in various groups of ostensibly healthy persons and psychiatric and other patients in the United States and Britain,* as well as among both native and foreign-born university entrants in Israel²⁵ and urban and rural Zulu population samples in South Africa.³⁹ This sex difference is usually seen in all parts of the CMI, and involves many questions other than those six concerning genitourinary symptoms which differ in the male and female versions of the questionnaire.⁴⁰

However, it cannot be inferred from these findings that there is more emotional disorder among women than there is among men. Although the total CMI score appears to be a valid measure of emotional health in both sexes, it is not necessarily of equal validity in each sex. A report on a CMI study in a home for the aged states that "the tendency for women to report more bodily and mood and feeling symptoms than the men report is confirmed by physicians at the institution, but they are unable to attribute this tendency to differences

in physical and mental health."³⁵ It has been suggested that the difference may be culturally determined, and that it may be more acceptable for women in the United States and Britain to complain than it is for men.^{9,35,40} It is also suggested that the questionnaire items may have been selected with a bias toward female symptoms and complaints.⁹

Facts adduced in support of the former suggestion are the findings that among New York hospital outpatients, women more often than men claimed to have specific diseases which were not recognized on examination, and that women more often than men complained of a family history of specific disorders. These claims often were associated with the assertion that they themselves also had these illnesses or symptoms.⁴⁰ Such findings are consistent with the conclusion reached on the basis of a long-term study of the illness experience of comparable groups of men and women in New York that "it seems very likely that the higher incidence of illness reported by the women, the greater amount of disability that they experienced and the greater number of visits that they made to the doctor, were largely the result of culturally determined differences in the attitudes toward what constitutes illness and what creates an acceptable reason for disability in men and in women."⁴¹

Clearly, what is required is a comparison of the CMI responses of men and women who are adjudged to have similar degrees of emotional disorder. Such a comparison might lead to the conclusion that different critical scoring levels should be used for men and women; if a cutting point of 30 is used for men, perhaps one of 40 should be used for women.

It is possible that the M-R score is less influenced by such cultural factors than the total score. As the ratios shown in Table 2 indicate, emotionally disturbed men and women tend to differ

* See references 7, 9, 23, 24, 26, 28, 30, 38.

Table 2—CMI scores of various groups of men and women: percentage with M-R scores of 10 or over

Group	Percentage		Ratio
	Women	Men	
A. Ostensibly Healthy Persons			
Employees in a London store (56, 48) ⁹	25	8	3.1
University entrants, Chicago ⁷			
US residents, white (905, 1,935)	4.3	3.0	1.4
US residents, nonwhite (69, 98)	4.3	2.0	2.2
Foreign students (151, 365)	7.3	4.4	1.7
Adults in a London general practice (50, 50) ²⁸	46	18	2.6
B. Patients (Nonpsychiatric)			
Medical outpatients, London (61, 34) ⁹	36	15	2.4
Surgical outpatients, London (55, 26) ⁹	41	16	2.6
Physical medicine outpatients, London (14, 10) ⁹	43	40	1.1
Patients not diagnosed as neurotic, London general practice (73, 67) ²⁶	30	12	2.5
C. Emotionally Disturbed Patients			
Patients with neurosis, London general practice (43, 19) ²⁶	63*	58*	1.1
Psychiatric outpatients, London (72, 46) ⁹	77	67	1.1
Psychiatric outpatients, London (38, 28) ²⁷	82	68	1.2

Note: The percentages are based upon the denominator figures shown in parentheses. In each instance, the first figure represents the number of women, and the second the number of men.

* Derived figure.

little in the proportion with an M-R score of 10 or above; similar findings have been reported among psychiatric patients in Nebraska.²² This suggests that this score may be preferable to the total score for sex comparisons in the United States and Britain. If this is so, the relatively marked sex differences found in most samples of nonpsychiatric patients and ostensibly healthy persons may well indicate a real sex difference in emotional health. Such a conclusion would be consistent with the findings of a number of surveys in these countries. It may be added parenthetically that the possibility that culturally determined effects, such as those predicated above, may also influence physicians in their diagnosis of emotional health, is itself a subject for study.

The use of the CMI in cross-cultural studies presents similar but more acute problems of comparative validity. A questionnaire designed in one culture for use in that culture is not necessarily applicable in other settings. A questionnaire similar to the CMI was found unusable among Okinawans; among other reasons, it was considered that "yes" responses indicated the extent not of neurosis, but of courtesy.⁴² Not only the responses to the questions, but also (as numerous studies have shown⁴³) the form taken by psychiatric disorder may differ from culture to culture.

Some of the difficulties in using the CMI in cross-cultural research have been reviewed by Chance in a report on its application to a group of Alaskan Eskimos.⁴⁴ It was necessary to delete

many questions which were not pertinent to or answerable by the Eskimos, to substitute words which could not easily be translated, and to modify questions to fit local idioms and behavioral differences. Even with these changes in content and terminology, it was found that Eskimo cultural attitudes to physical impairment, the expression of anxiety, and the decision-making process directly influenced the responses to many of the questions. It was concluded that Eskimo attitudes on these topics were sufficiently different from "North American" cultural attitudes to invalidate the comparability of their CMI responses. It was considered, however, that there was a sufficient degree of conceptual equivalence in the questions dealing with physical symptoms to warrant further study.

A recent review of the use of the CMI in a Zulu population points out that in a nonwestern culture with a highly organized system of classifications of disease and concepts of disease etiology, the classification of CMI questions in organ-systems or by disease areas may seem to present symptoms in a meaningless or confusing context.³⁹ To this may be added the possibility that complaints which are common and clinically meaningful in such a culture may not be covered by the CMI. It was considered that the very high CMI scores found in the Zulu samples, by comparison with those reported in United States groups, might at least partly reflect a cultural bias. It is concluded that the CMI "yields at best an extremely crude population health profile," but that efforts are justified at item-by-item refinement of this and similar instruments and their experimental use in a wider range of cultures. It may be noted that the CMI has been found a useful clinical tool among Zulu patients.

It would appear that whatever the validity of the CMI as a health measure in various cultures, in its present form

it can be of little value in comparative studies of the health status of widely divergent cultures.

The problem of cultural variation is probably most important, because least obvious, in comparisons of subgroups of a population sharing the same language and a common general culture. Such subgroups may have their own subcultures, with implications for their CMI responses; one example, the possible influence of sex-specific cultural variation, has already been discussed. A study of army inductees in New Jersey provides a useful further example.⁴⁵ Among these apparently healthy men who had recently passed through pre-induction and induction clinical examinations, significantly higher CMI scores were found among those of Italian or Jewish ethnic origin than among those of British, Irish, or German origin. It is suggested that these findings probably reflected culturally induced differences in the perception and reporting of symptoms; the presence of real differences in the health of the various groups could, however, not be entirely ruled out.

It is thus apparent that it may be wrong to interpret group differences in CMI responses as indicating health differences without some indication that the CMI is of comparable validity, or ancillary evidence of group differences in health. This applies not only to differences in CMI responses between ethnic groups, such as those reported among university students both in the United States⁷ and in Israel,²⁵ but also to associations found with other variables which may have cultural connotations, such as age,^{25,39,40} educational level,⁴⁵ and urban living.^{32,39}

Application in Epidemiological Studies

The results which have been cited suggest that the main value of the CMI in epidemiological studies is as an indicator of the presence and degree of emotional disorder. In a recent review,

Blum has drawn attention to the problems of case identification in psychiatric epidemiology, highlighting the absence of agreed criteria and definitions of mental disorder and the lack of diagnostic methods of proven reliability and validity.³⁴ Under these circumstances, it is difficult to evaluate the CMI in comparison with other tools which may be used for this purpose. It is at least arguable that in the United States and Britain the CMI is at present about as useful as any other simple method. Elsewhere, validity studies should precede such use of the questionnaire. The CMI may also be of use as an indicator of general over-all health; this may be secondary to the association with emotional health.

The CMI has been used as an indicator of emotional disorder both in epidemiological studies of emotional ill-health and in studies of the role of emotional disturbances in the epidemiology of other disorders. It has been used in investigations of the prevalence of psychiatric illness (where its possible role as the screening phase of a double-sampling procedure has not been sufficiently explored), and in inquiries into the role of various factors in the epidemiology of emotional disorder. A London study has used the CMI in an exploration of associations between neurosis and childhood experiences, marital relationships, social class, and other variables.^{28,29,46,47,49} The CMI has been used in studies of the influence of familial factors on emotional disorders; a parallelism has been demonstrated in the CMI responses of husbands and wives²⁸ and of mothers and daughters,³¹ and evidence found of the influence of intergenerational culture conflict within the family.⁴⁸ It has also been used as a measure of emotional health in studies of such conditions as asthma,⁴⁹ pulmonary tuberculosis,⁵⁰ hypertension,³⁹ rheumatoid arthritis,⁵¹ and cigarette addiction.⁵²

In its present form, the CMI appears to be of little value in cross-cultural epidemiological studies, although it may provide useful data on comparative patterns of complaint. Even within a single culture, the use of the CMI in comparing the health of groups is not free of problems. CMI responses should be used as the sole evidence of group differences in health only if there is some indication of comparable validity.

Modifications of the CMI may further increase its usefulness. One published modification, the Columbia Adult Inventory,⁵³ is designed for specific use with older persons.³⁵ It may be possible to increase the value of the questionnaire by incorporating sets of questions, such as Cobb's Index of Rheumatoid Arthritis, with a proved validity as indicators of specific disorders. Its validity as a measure of emotional or general health might also be enhanced by such changes as the omission of certain questions with little apparent relevance to the respondent's health status.

Summary

The Cornell Medical Index (CMI), a health questionnaire originally designed as an aid to the clinician, appears to be of value as an epidemiological tool. Numerous studies support its validity as a measure of the presence and degree of emotional ill-health. It is also of possible use as an index of general over-all health. It is of relatively little value as an indicator of the presence of specific disorders, or of general somatic health.

In its present form, the CMI is of little value in cross-cultural health studies, except as an indicator of patterns of complaint. Its use in health comparisons of groups within a single culture requires some indication of comparable validity in the groups compared.

The CMI has been used as an indi-

cator of emotional disorder both in epidemiological studies of emotional ill-health and in studies of the role of emotional disturbance in the epidemiology of other disorders. Modifications of the CMI may enhance its usefulness.

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1966 AOAC Harvey W. Wiley Award

Nominations for the tenth annual Harvey W. Wiley Award presented by the Association of Official Analytical Chemists are now being accepted. The purpose of the award, which consists of a purse of \$750, is to recognize an outstanding scientist or scientific team for contributions and achievements in analytical methodology of interest to agricultural and public health scientists. Nominees need not be members of the AOAC.

The award was established in 1956 in honor of the father of the first Pure Food and Drug Law who was also one of the founders of the association, known until 1965 as the Association of Official Agricultural Chemists. For nomination forms write: Luther G. Ensminger, Assistant Secretary, Association of Official Analytical Chemists, Box 540, Benjamin Franklin Station, Washington, D. C. 20044. Nominations must be received by April 1, 1966.